

WHAT IS CLAIMED IS:

1. A photoelectric conversion device comprising:

5 a photoelectric conversion region for accumulating electric charges that correspond to incident light; and

an amplifying field effect transistor into which a signal charge from the photoelectric conversion region is inputted, wherein:

10 the photoelectric conversion region is surrounded by a potential barrier region;

a nick region is formed in a part of the potential barrier region; and

15 one of main electrode regions of the field effect transistor is placed adjacent to the nick region, the main electrode region having the same conductivity type as the photoelectric conversion region.

20 2. A photoelectric conversion device according to claim 1, wherein the potential barrier region includes at least a selectively oxidized film and a channel stopping layer directly below the selectively oxidized film.

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3. A photoelectric conversion device according to claim 1, wherein the potential barrier region

includes at least a buried isolation region whose conductivity type is opposite to that of the photoelectric conversion region.

5 4. A photoelectric conversion device according to claim 1, wherein the photoelectric conversion region is formed in a low impurity concentration region that is doped with an impurity of the same conductivity type as the photoelectric conversion
10 region in a concentration lower than the impurity concentration of the photoelectric conversion region.

 5. A photoelectric conversion device according to claim 4, wherein a buried isolation region whose
15 conductivity type is opposite to the conductivity type of the photoelectric conversion region is formed below the field effect transistor.

 6. A photoelectric conversion device according
20 to claim 5,
 wherein the buried isolation region placed below the field effect transistor surrounds a region larger than the photoelectric conversion region, and
 wherein the region surrounded by the buried
25 isolation region functions as a photosensitive region.

 7. A photoelectric conversion device according

to claim 1, wherein an impurity diffusion region whose conductivity type is opposite to the conductivity type of the photoelectric conversion region is provided in the nick region.

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8. A photoelectric conversion device according to claim 5, wherein the buried isolation region is not placed in an area below the one main electrode region of the field effect transistor, at least, a
10 part of the area.

9. A photoelectric conversion device according to claim 1,

wherein the potential barrier region includes
15 at least a semiconductor region whose conductivity type is opposite to the conductivity type of the photoelectric conversion region, and

wherein a buried region that is doped with an impurity of the same conductivity type as the
20 semiconductor region in a concentration lower than the impurity concentration of the semiconductor region is placed in the nick region.

10. A photoelectric conversion device according
25 to claim 4, wherein the low impurity concentration region is one of a semiconductor substrate, an epitaxial layer, and a well.

11. A photoelectric conversion device according to claim 1, wherein the one main electrode region is connected to a fixed electric potential or a similar electric potential.

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12. A photoelectric conversion device according to claim 1, wherein a semiconductor region whose conductivity type is opposite to the conductivity type of the photoelectric conversion region is placed
10 below the photoelectric conversion region.

13. An image pick-up system, comprising:
a photoelectric conversion device according to claim 1;
15 an optical system for forming an image in the photoelectric conversion device; and
a signal processing circuit for processing a signal outputted from the photoelectric conversion device.

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